N
2-18-05

MWH

February 18, 2005

Mr. Kevin Adler
Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SR-J6
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Pesticide Re-Sampling Results for PW-A (1007 Reder Road)
2004 Residential Well Sampling Event
ACS NPL Site, Griffith, Indiana

Dear Mr. Adler:

Please find enclosed the results of the re-sampling activities for residential well PW-A, located at 1007 Reder Road, Griffith, Indiana. Per your request, MWH re-sampled this residential well after the pesticide 4,4' DDT was detected at an estimated concentration of 0.01 micrograms per liter (µg/L) during the September 2004 sampling event. No other pesticides or poly-chlorinated biphenyls (PCBs) were detected in the September 2004 sample.

Residential well PW-A was re-sampled on January 7, 2005. MWH was unable to sample the well from the usual outside spigot due to ice present in the line. With permission from the resident, MWH collected a sample of pre-treated water from a spigot located in the basement of the house. The water sample and the appropriate quality control samples were sent overnight to CompuChem Laboratories in Cary, North Carolina, for analysis of pesticides.

Table 1 presents the September 2004 and January 2005 sampling results for the pesticide 4,4' DDT in samples collected at residential well PW-A. The pesticide 4,4' DDT was not detected above the reporting limit of 0.02 µg/L in the sample or the duplicate collected from this well in January 2005. We have provided summary tables in Attachment A showing the complete pesticide results for both sampling dates. The laboratory analytical report and data validation narrative for the January 2005 samples are provided in Attachment B.

If you need additional copies of these tables, please let me know and we can forward them to you, or whomever you specify.



175 West Jackson Boulevard
Suite 1900
Chicago, Illinois
60604-2814

Tel: 312 831 3000
Fax: 312 831 3889

Sincerely,

MWH Americas, Inc.

for Peter J. Vagt, Ph.D., CPG
Vice President

cc: Prabhakar Kasarabada, IDEM
L. Campbell, B&V
Barbara Magel, Karaganis White & Magel, Ltd.
Mark Travers, Environ

Enclosures: Table 1 – Summary of 4,4' DDT Results – Residential Well PW-A
Attachment A – PCB/Pesticide Results: September 2004 and January 2005
Attachment B – January 2005 Laboratory Analytical Report and Data Validation Narrative

ALC/CAS/PJV/jmf
J:\209\0603 ACS\0305 Residential Sampling\2004\EPA Letter\EPA Cover2004_PWAresample.doc

# Tables

MWH

# Table 1
## Summary of 4,4'-DDT Results - Residential Well PW-A
## American Chemical Service NPL Site
## Griffith, Indiana

| Pesticide Analyte | U.S. EPA Maximum Contaminant Level | Laboratory Reporting Limit (ug/l) | September 2004 | January 2005 resample | |
|---|---|---|---|---|---|
| | | | Result (ug/l) | Result | Duplicate |
| 4,4'-DDT | NA | 0.02 | 0.01 J | ND | ND |

**Notes:**

PW-A = 1007 Reder Road

All results in micrograms per liter (ug/l)

NA = Maximum Contaminant Level not available for this analyte

J = Concentration listed was detected below the laboratory reporting limit, and is considered to be an estimated value.

ND = Not detected. Analyte was not detected above the reporting limit.

# Appendix A

# Residential Well PW-A
# 1007 Reder Road
# September 2004 PCB/Pesticide Results

| Well | PCB/Pesticide Analyte | Result | Units | LQ | DQ | Detection Limit |
|---|---|---|---|---|---|---|
| PW-A | 4,4'-DDD | | ug/l | U | | 0.02 |
| PW-A | 4,4'-DDE | | ug/l | U | | 0.02 |
| PW-A | 4,4'-DDT | 0.01 | ug/l | J | | 0.02 |
| PW-A | Aldrin | | ug/l | U | | 0.01 |
| PW-A | alpha-BHC | | ug/l | U | | 0.01 |
| PW-A | alpha-Chlordane | | ug/l | U | | 0.01 |
| PW-A | Aroclor-1016 | | ug/l | U | | 0.20 |
| PW-A | Aroclor-1221 | | ug/l | U | | 0.40 |
| PW-A | Aroclor-1232 | | ug/l | U | | 0.20 |
| PW-A | Aroclor-1242 | | ug/l | U | | 0.20 |
| PW-A | Aroclor-1248 | | ug/l | U | | 0.20 |
| PW-A | Aroclor-1254 | | ug/l | U | | 0.20 |
| PW-A | Aroclor-1260 | | ug/l | U | | 0.20 |
| PW-A | beta-BHC | | ug/l | U | | 0.01 |
| PW-A | delta-BHC | | ug/l | U | | 0.01 |
| PW-A | Dieldrin | | ug/l | U | | 0.02 |
| PW-A | Endosulfan I | | ug/l | U | | 0.01 |
| PW-A | Endosulfan II | | ug/l | U | | 0.02 |
| PW-A | Endosulfan sulfate | | ug/l | U | | 0.02 |
| PW-A | Endrin | | ug/l | U | | 0.02 |
| PW-A | Endrin aldehyde | | ug/l | U | | 0.02 |
| PW-A | Endrin ketone | | ug/l | U | | 0.02 |
| PW-A | gamma-BHC | | ug/l | U | | 0.01 |
| PW-A | gamma-Chlordane | | ug/l | U | | 0.01 |
| PW-A | Heptachlor | | ug/l | U | | 0.01 |
| PW-A | Heptachlor epoxide | | ug/l | U | | 0.01 |
| PW-A | Methoxychlor | | ug/l | U | | 0.10 |
| PW-A | Toxaphene | | ug/l | U | | 1.00 |

**Notes**

ug/l = micrograms per liter

Blank cell indicates analyte not detected in sample

LQ = Lab qualifier

DQ = Data Validation qualifier

U = Analyte was not detected above the detection limit

J = Estimated value; concentration detected is below detection limit

# Residential Well PW-A
# 1007 Reder Road
# January 2005 PCB/Pesticide Results

| Well | PCB/Pesticide Analyte Resample | Result | Units | LQ | DQ | Detection Limit |
|---|---|---|---|---|---|---|
| PW-A | 4,4'-DDD | | ug/l | U | | 0.02 |
| PW-A | 4,4'-DDE | | ug/l | U | | 0.02 |
| PW-A | 4,4'-DDT | | ug/l | U | | 0.02 |
| PW-A | Aldrin | | ug/l | U | | 0.01 |
| PW-A | alpha-BHC | | ug/l | U | | 0.01 |
| PW-A | alpha-Chlordane | | ug/l | U | | 0.01 |
| PW-A | Aroclor-1016 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1221 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1232 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1242 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1248 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1254 | NA | ug/l | NA | NA | NA |
| PW-A | Aroclor-1260 | NA | ug/l | NA | NA | NA |
| PW-A | beta-BHC | | ug/l | U | | 0.01 |
| PW-A | delta-BHC | | ug/l | U | | 0.01 |
| PW-A | Dieldrin | | ug/l | U | | 0.02 |
| PW-A | Endosulfan I | | ug/l | U | | 0.01 |
| PW-A | Endosulfan II | | ug/l | U | | 0.02 |
| PW-A | Endosulfan sulfate | | ug/l | U | | 0.02 |
| PW-A | Endrin | | ug/l | U | | 0.02 |
| PW-A | Endrin aldehyde | | ug/l | U | | 0.02 |
| PW-A | Endrin ketone | | ug/l | U | | 0.02 |
| PW-A | gamma-BHC | | ug/l | U | | 0.01 |
| PW-A | gamma-Chlordane | | ug/l | U | | 0.01 |
| PW-A | Heptachlor | | ug/l | U | | 0.01 |
| PW-A | Heptachlor epoxide | | ug/l | U | | 0.01 |
| PW-A | Methoxychlor | | ug/l | U | | 0.10 |
| PW-A | Toxaphene | NA | ug/l | NA | NA | NA |

**Notes**

ug/l = micrograms per liter

Blank cell indicates analyte not detected in sample

LQ = Lab qualifier

DQ = Data Validation qualifier

U = Analyte was not detected above the detection limit

NA = Not Analyzed

# Appendix B

**CompuChem**
**a division of Liberty Analytical Corp.**

12-Jan-05

CHAD SMITH
MONTGOMERY WATSON HARZA
175 WEST JACKSON BOULEVARD
SUITE 1900
Chicago, IL 606042814

Subject:
Report of Data-Project: ACS Workorder: 5452

Attn.: CHAD SMITH

Enclosed are the results of analytical work performed in accordance with the referenced account number.

This report covers sample(s) appearing on the attached listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097.

Sincerely,

CompuChem
A Division of Liberty Analytical

Attachment

TOTAL NUMBER
OF PAGES____

**501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050**

# CompuChem, a division of Liberty Analytical

| Hsn | Client ID | Wordorder | Matrix | Account | Project | Report |
|---|---|---|---|---|---|---|
| 545201 | ACS-GW-PWA-24 | 5452 | W | MWH | ACS | |
| 545202 | ACS-GW-DUP01-24 | 5452 | W | MWH | ACS | |

# SAMPLE DATA PACKAGE

The sample data package shall include data for all analyses of all samples in one Sample Delivery Group (SDG), including field samples, dilutions, reanalyses, and Laboratory Control Samples. The sample data package consists of the following:

A. SDG Narrative

B. Traffic Reports

C. Volatiles Data

D. Semivolatiles Data

E. Pesticide / Aroclor Data

LAB CODE : LIBRTY CONTRACT # : OLC03-REVS

CASE # : _____ SDG # : 5452

# A. SDG Narrative

# CompuChem

**a division of Liberty Analytical Corporation**
**501 Madison Avenue**
**Cary, N.C. 27513**
**Tel: 919/379-4100 Fax: 919/379-4050**


## SDG NARRATIVE
## SDG # 5452
## CONTRACT # OLC03-REVS

**SAMPLE IDENTIFICATIONS:**

**ACS-GW-DUP01-24**
**ACS-GW-PWA-24**

The two water samples listed above were received intact, with proper documentation, in sealed shipping containers, on January 10, 2005. These samples were received at a temperature of 1.7 degrees Celsius. Samples received for organic analysis are required to be preserved at 4 degrees Celsius. The client was contacted, and the laboratory was instructed to proceed with the analyses. The samples were scheduled for the requested analyses of the pesticide fraction. The samples were prepared and analyzed following the current EPA Contract Laboratory Program (CLP) Statement of Work (SOW), Low Concentration Water, Document OLC03.2. All pertinent Quality Assurance notices are included in the narrative section and all pertinent Laboratory notices for SDG # 5452 are included in the sample data sections.

**Pesticides**

Extraction and analysis holding time requirements were met for these samples.

There were no pesticide Target Compound List (TCL) analytes confirmed by dual column analysis above the Contract Required Quantitation Limit (CRQL) in these samples.

Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG.

All of the surrogates met recovery and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria.

Sample ACS-GW-PWA-24 was used as the original to prepare the duplicate matrix spikes as requested. The associated duplicate matrix spikes met all accuracy and precision criteria.

The associated Laboratory Control Sample (LCS) prepared and analyzed along with these samples met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

**Elsie S. Byrd**
Senior Scientist I
January 12, 2005

# GC and GC/MS Column and Trap Specifications Table

## COLUMNS

| Brand Name | Coating Material | ID (mm) | Film Thickness (um) | Length (m) |
|---|---|---|---|---|
| **GC Laboratory** | | | | |
| Restek | RTX-1701 | 0.53 | 0.5 | 30 |
| J & W | DB-608 | 0.53 | 0.83 | 30 |
| Restek | CLPesticides | 0.53 | 0.5 | 30 |
| Restek | CLPesticides II | 0.53 | 0.42 | 30 |
| **GC Volatiles Laboratory** | | | | |
| Restek | RTX-1 | 0.53 | 0.5 | 105 |
| Restek | RTX-502.2 | 0.53 | 0.5 | 105 |
| **GC/MS Volatiles Laboratory** | | | | |
| J & W | DB-624 | 0.53 | 3.0 | 30/75 |
| J & W | DB-624 | 0.25 | 1.4 | 60 |
| J & W | DB-624 | 0.32 | 1.8 | 60 |
| Restek | RTX-624 | 0.32 | 1.8 | 60 |
| Restek | RTX-VMS* | 0.18 | 1.0 | 20 |
| Supelco | SPB-624 | 0.32 | 1.4 | 60 |
| Supelco | Equity™-624 | 0.53 | 3.0 | 75 |
| Zebron | ZB-624 | 0.32 | 1.8 | 60 |
| **GC/MS Semivolatiles Laboratory** | | | | |
| Restek | RTX-5MS | 0.25 | 0.25 | 30 |
| Restek | RTX-5MS | 0.32 | 0.25 | 30 |
| **HPLC Laboratory** | | | | |
| Supelco | Supelcosil LC-PAH | 4.6 | 5.0 | 15 cm |
| Supelco | Discovery RP Amide C16 | 4.6 | 5.0 | 25 cm |
| Restek | Pinnacle Cyano | 4.6 | 5.0 | 25 cm |
| Restek | Allure C18 | 4.6 | 5.0 | 25 cm |

*Note: The RTX-VMS column is currently not used for EPA CLP analyses.

## TRAPS

| GC and GC/MS Volatiles Laboratory | |
|---|---|
| Tekmar 3 | * 8 cm of 2,6-diphenylene oxide polymer (Tenax)<br>* 8 cm of silica gel<br>* 7 cm of coconut charcoal<br>* 0.5 cm of silanized glass wool at each end |
| Tekmar 5 | * 1 cm of methyl silicone packing (OV-1 coating)<br>* 8 cm of 2,6-diphenylene oxide polymer (Tenax)<br>* 8 cm of silica gel<br>* 7 cm of coconut charcoal<br>* 0.5 cm of silanized glass wool at each end |
| Supelco K (Vocarb3000) | * 10 cm of Carbopack B (Graphitized Carbons)<br>* 6 cm of Carboxen 1000 (Carbon molecular sieves)<br>* 1 cm of Carboxen 1001 (Carbon molecular sieves) |

# CompuChem

**a division of Liberty Analytical Corporation**

## CompuChem's Pagination Convention

As required by the current EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is CompuChem's policy to add in an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.).

**CompuChem**
a division of Liberty Analytical Corporation

# Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC chemists. An Extracted Ion Current Profile (EICP) or a GC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC analysis. The manual editing/integration flags are:

**M** - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak.

**H** - Denotes that the data reviewer, GC/MS operator, or GC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

**MH** - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

**L** - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

**ML** - Denotes that an alternate library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

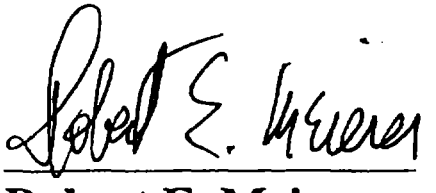
The EPA CLP SOW documents require additional explanations for manual editing/integration. In the accompanying raw data packages, additional codes have been applied to the "M" flag and carry the following meanings;

**M1** - The compound was not found by the automatic integration routine.

**M2** - The compound was incorrectly integrated by the automatic integration routine.

**M3** - The co-eluting compounds were incorrectly integrated by the automatic integration routine.

These codes will appear in the GC/MS and GC data packages.



**Robert E. Meierer**
Vice President

Revision 6 (3/25/02)

# DATA REPORTING QUALIFIERS *(continued)*

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a response greater than the upper level of the calibration range will have the concentration flagged with an E on Form I for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on Form I for the more diluted sample, and all reported concentrations on that Form I are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds which are not detected in the sample analysis i.e. compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate Form Is are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No. XXXXXDL) i.e. the results from both analyses <u>are not combined</u> on a single Form I.

A : This flag indicates that a TIC is a suspected aldol-condensation product.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y and Z.

# DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1.0 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide/Arocior or other GC or HPLC identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search. For generic characterization of a TIC such as 'chlorinated hydrocarbon', the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the higher of the two values is reported and flagged with a P. When the RPD is equal to or less than 40%, our policy is to also report the higher of the two values, although the choice could be a project specific issue. For certain HPLC analyses, if one of the HPLC columns displays co-elution of target analytes, all results are reported from a primary column displaying no co-elution. Results are still flagged with a P if the RPD between columns is greater than 40%.

# B. Traffic Reports

The laboratory shall include a copy of the Traffic Reports for all of the samples in the SDG. The Traffic Reports shall be arranged in increasing EPA Sample ID number order, considering both letters and numbers.

№ 01232

# CHAIN OF CUSTODY

Page 1 of 1

**CompuChem**
**a division of Liberty Analytical Corp.**

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier: Fed Ex
Airbill No.:
Sampling Complete? (Y) or N

| | |
|---|---|
| Company Name: MWH | Project Name: AGS - GROUNDWATER |
| Address: 175 W. Jackson Ste 1900 | Sampling Location: RESIDENTIAL WELLS |
| City: Chicago State: IL Zip: 60604 | Turnaround time: Normal |
| Project Contact: Chad Smith | Batch QC or Project Specific? If Specific, which Sample ID? Project Specific QAPP |
| Phone #: 312 831-3453 | Are aqueous samples field filtered for metals? Y or N |
| Sampler's Name: C. Smith / M. Mosack | Are high concentrations expected? Y or N? If yes, which ID(s)? No |

GW - Ground water
WW - Waste water
SW - Surface water
SO - Soil/Sediment
TB - Trip Blank
RI - Rinsate
WP - Wipe
O - Other

| Lab ID | Field ID | Collection 2005 Date | Collection Time | Matrix | # of bottles | Number of Preserved Bottles: HCl | NaOH | HNO3 | H2SO4 | MEOH | Other Na2S2O3 | Low-Level Pesticides |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 545201 | ACS-GW-PWA-24 | 1/7 | 1095 | GW | 6 | | | | | | X | 6 |
| 545202 | ACS-GW-DUP01-24 | 1/7 | 1018 | GW | 2 | | | | | | X | 2 |

MS-MSD

Lab Use Only

Sample Unpacked By: [signature]
Sample Order Entry By: [signature]
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Sample is to be analyzed for low level pesticides (25ml purge) per ACS QAPP for residential wells
Please call w/ questions & for log sheets

Sample Custody

| | | | | |
|---|---|---|---|---|
| Relinquished by: [signature] | Date/Time: 1/7 1800 | Received by: Bob Mahon | Date/Time: 01-08-05 0950 | |
| Relinquished by: | Date/Time: | Received by: | Date/Time: | |
| Subcontact? Y or N If yes, where? | | Custody Seal(s) intact? (Y) or N | On Ice? (Y) or N Client Courier | Cooler Temp: 1.7 °C |

...les st... days ...te re... iled at ...ra cha... Wh... ellow ...to lab ...in ...fustor

# CompuChem

a division of Liberty Analytical Corp.

## WORKORDER SUMMARY REPORT

**Workorder:** 5452 **Account:** MWH **Project:** ACS
**SDG-Case:** ACS **Status:** CLOSED **QC Type:** CLIENT SPECIFIC MS/MSD
**Report Style:** COMPUCHEM STYLE 9 WITH EDD AND CD

| SAMPLE ID | CLIENT ID | COLLECT DATE | RECEIVE DATE | DUE DATE | COMMENTS |
|---|---|---|---|---|---|
| 545201 | ACS-GW-PWA-24 | 1/7/2005 | 1/10/2005 | 1/23/2005 | **USE FOR QC**PPS1002**RPT PEST ONLY BY OLC3.2** |
| W | QCW-32PP | QC-OLC03.2 PP WATER | | | |
| W | GW32PTCL | PST OLC03.2 TCL WATER | | | |
| 545202 | ACS-GW-DUP01- | 1/7/2005 | 1/10/2005 | 1/23/2005 | PPS1002**RPT PEST ONLY BY OLC3.2** |
| W | GW32PTCL | PST OLC03.2 TCL WATER | | | |

# CompuChem, a Division of Liberty Analytical

## Extract Chain of Custody

Batch: 6084 Date: 1/10/2005

Department: Organic Extractions

| Sample ID | Client ID | Product | Matrix | Hold Date |
|---|---|---|---|---|
| 540703 | B1J01 | GW-PP-32X | W | 1/11/2005 |
| 540703 | B1J01 | GW32PPX | W | 1/12/2005 |
| 545201 | ACS-GW-PWA-2 | GW32PPX | W | 1/14/2005 |
| 545201 | ACS-GW-PWA-2 | GW32PSTX | W | 1/14/2005 |
| 545202 | ACS-GW-DUP0 | GW32PSTX | W | 1/14/2005 |
| 56965 | PBLKHX | GW32PPX | W | 1/17/2005 |
| 56966 | PLCSHX | GW32PPX | W | 1/17/2005 |
| 56967 | B1J01MS | GW32PPX | W | 1/12/2005 |
| 56968 | B1J01MSD | GW32PPX | W | 1/12/2005 |
| 56999 | ACS-GW-PWA-2 | GW32PPX | W | 1/14/2005 |
| 57000 | ACS-GW-PWA-2 | GW32PPX | W | 1/14/2005 |

1-10-2

| Relinquished By: | Received By: | Date/Time |
|---|---|---|
| RB | GC #3 | 1-10-05 5:00 |
| Refrig #3 | ANP | 1/10/05 6:5 pm |
| ANP | Refrig #8 | 1/10/05 6:5 pm |
| | | |
| | | |
| | | |
| | | |
| | | |

# 2. Pesticide/Aroclor Sample Data

Sample data shall be arranged in packets with the Organic Analysis Data Sheet (Form I LCP), followed by the raw data for pesticide samples. These sample packets shall be placed in increasing EPA sample number order, considering both letters and numbers.

a. Target Compound List (TCL) Analyte Results (Form I LCP)

Tabulated results (identification and quantitation) shall be included.

b. Copies of Pesticide Chromatograms

Positively identified compounds shall be labeled with the names of compounds, either directly out from the peak on the chromatogram, or on a printout of retention times on the data system printout if retention times are printed over the peak on the chromatogram. Include for each sample or sample extract, including dilutions and reanalyses. The Chromatogram shall contain the following header information:

EPA sample number, volume injected (μL), date and time of injection, GC column ID (by stationary phase and internal diameter), GC instrument ID, and the scaling factor.

c. Copies of Pesticide Chromatograms from the Second Column

d. Data System Printout

A printout of retention time and corresponding peak height or peak area shall accompany each chromatogram. Where edits have been made, initialing, dating and integration time range are required.

e. Manual Worksheets

1LCE
LOW CONCENTRATION WATER PESTICIDE ORGANICS ANALYSIS
DATA SHEET

EPA SAMPLE NO.

ACS-GW-DUP01-24

Lab Name: COMPUCHEM Contract: OLC03-REVS

Lab Code: LIBRTY Case No.: Client No.: SDG No.: 5452

Lab Sample ID: 545202 Date Received: 01/10/2005

Sample Volume: 1100(ML) Date Extracted: 01/10/2004

Concentrated Extract Volume: 2000(UL) Date Analyzed: 01/10/2005

Injection Volume: 1.0(UL) Dilution Factor: 1.0

Sulfur Cleanup: (Y/N) N Extraction: (Sepf/Cont) SEPF

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (UG/L) | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 0.010 | U |
| 319-85-7 | beta-BHC | 0.010 | U |
| 319-86-8 | delta-BHC | 0.010 | U |
| 58-89-9 | gamma-BHC (Lindane) | 0.010 | U |
| 76-44-8 | Heptachlor | 0.010 | U |
| 309-00-2 | Aldrin | 0.010 | U |
| 1024-57-3 | Heptachlor epoxide | 0.010 | U |
| 959-98-8 | Endosulfan I | 0.010 | U |
| 60-57-1 | Dieldrin | 0.020 | U |
| 72-55-9 | 4,4'-DDE | 0.020 | U |
| 72-20-8 | Endrin | 0.020 | U |
| 33213-65-9 | Endosulfan II | 0.020 | U |
| 72-54-8 | 4,4'-DDD | 0.020 | U |
| 1031-07-8 | Endosulfan sulfate | 0.020 | U |
| 50-29-3 | 4,4'-DDT | 0.020 | U |
| 72-43-5 | Methoxychlor | 0.10 | U |
| 53494-70-5 | Endrin ketone | 0.020 | U |
| 7421-93-4 | Endrin aldehyde | 0.020 | U |
| 5103-71-9 | alpha-Chlordane | 0.010 | U |
| 5103-74-2 | gamma-Chlordane | 0.010 | U |

1LCE
LOW CONCENTRATION WATER PESTICIDE ORGANICS ANALYSIS
DATA SHEET

EPA SAMPLE NO.

ACS-GW-PWA-24

Lab Name: COMPUCHEM Contract: OLC03-REVS

Lab Code: LIBRTY Case No.: Client No.: SDG No.: 5452

Lab Sample ID: 545201 Date Received: 01/10/2005

Sample Volume: 1100(ML) Date Extracted: 01/10/2004

Concentrated Extract Volume: 2000(UL) Date Analyzed: 01/10/2005

Injection Volume: 1.0(UL) Dilution Factor: 1.0

Sulfur Cleanup: (Y/N) N Extraction: (Sepf/Cont) SEPF

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (UG/L) | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 0.010 | U |
| 319-85-7 | beta-BHC | 0.010 | U |
| 319-86-8 | delta-BHC | 0.010 | U |
| 58-89-9 | gamma-BHC (Lindane) | 0.010 | U |
| 76-44-8 | Heptachlor | 0.010 | U |
| 309-00-2 | Aldrin | 0.010 | U |
| 1024-57-3 | Heptachlor epoxide | 0.010 | U |
| 959-98-8 | Endosulfan I | 0.010 | U |
| 60-57-1 | Dieldrin | 0.020 | U |
| 72-55-9 | 4,4'-DDE | 0.020 | U |
| 72-20-8 | Endrin | 0.020 | U |
| 33213-65-9 | Endosulfan II | 0.020 | U |
| 72-54-8 | 4,4'-DDD | 0.020 | U |
| 1031-07-8 | Endosulfan sulfate | 0.020 | U |
| 50-29-3 | 4,4'-DDT | 0.020 | U |
| 72-43-5 | Methoxychlor | 0.10 | U |
| 53494-70-5 | Endrin ketone | 0.020 | U |
| 7421-93-4 | Endrin aldehyde | 0.020 | U |
| 5103-71-9 | alpha-Chlordane | 0.010 | U |
| 5103-74-2 | gamma-Chlordane | 0.010 | U |

**ACS-89**
**Data Validation Reports**
**LDC# 13050**

Chlorinated Pesticides

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** ACS-89

**Collection Date:** January 7, 2005

**LDC Report Date:** February 1, 2005

**Matrix:** Water

**Parameters:** Chlorinated Pesticides

**Validation Level:** EPA Level IV

**Laboratory:** CompuChem

**Sample Delivery Group (SDG):** 5452

**Sample Identification**

ACS-GW-PWA-24
ACS-GW-DUP01-24
ACS-GW-PWA-24MS
ACS-GW-PWA-24MSD

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Contract Laboratory Program Statement of Work OLC03.2 for Chlorinated Pesticides.

The review follows the Remedial Design/Remedial Action PRP - Lead Project Quality Assurance Project Plan (November 2001, Rev. 0) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

B Compound or analyte was positively detected in a sample and in an associated blank.

UB Compound or analyte is not detected at or above the indicated concentration due to blank contamination.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/ECD Instrument Performance Check

A Resolution check mixture was analyzed at the beginning of the initial calibration sequence on each GC column. The resolution between adjacent peaks of required compounds was greater than or equal to 60% .

Performance evaluation mixtures (PEM) were analyzed at the proper frequency. The resolution between adjacent peaks was 90% on both GC columns. The absolute retention times for the initial and continuing PEMs were within the calculated retention time windows based on the three-point initial calibration.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 20.0% and the combined breakdowns were less than or equal to 30.0% .

The relative percent difference (RPD) of amount in PEMs were within 25.0% QC limits.

## III. Initial Calibration

Initial calibration sequence was followed as required.

Initial calibration of single and multicomponent compounds was performed for both columns at proper frequencies.

The retention time windows were established according to the method.

The percent relative standard deviations (%RSD) of calibration factors for selected single component compounds were within the 20.0% QC limits for selected compounds and were within the 25.0% QC limits for alpha-BHC and beta-BHC .

All required peaks for multicomponent compounds were present.

## IV. Continuing Calibration

Continuing calibration sequence was followed as required. No more than 12 hours elapsed between continuing calibration analyses in an analytical sequence.

The retention times (RT) of all compounds in Individual Mix and multicomponent standards were within QC limits.

The relative percent differences (RPD) of amount in Individual Mix standards were within the 25.0% QC limits.

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

Instrument blank analyses were performed at the required frequencies. No chlorinated pesticide contaminants were found in the instrument blanks.

No field blanks were identified in this SDG.

## VI. Surrogate Spikes

Surrogates were added to all samples, standards and blanks as required by the SOW. All surrogate recoveries (%R) were within QC limits of 30-150% .

The retention times for surrogates were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## VIII. Laboratory Control Samples (LCS)

Although laboratory control samples were not required by the method, laboratory control samples were reported by the laboratory. Percent recoveries (%R) were within QC limits.

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Pesticide Cleanup Checks

### a. Florisil Cartridge Check

Florisil cartridge checks were performed at the required frequency and all compounds were within the 80-120% recovery QC criteria.

### b. GPC Calibration

GPC cleanup is not required for water samples and was not performed.

## XI. Target Compound Identification

All target compound identifications were within validation criteria.

## XII. Compound Quantitation and Reported CRQLs

All compound quantitation and reported CRQLs were within validation criteria.

## XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

## XIV. Field Duplicates

Samples ACS-GW-PWA-24 and ACS-GW-DUP01-24 were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

**ACS-89**
**Chlorinated Pesticides - Data Qualification Summary - SDG 5452**

No Sample Data Qualified in this SDG

**ACS-89**
**Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 5452**

No Sample Data Qualified in this SDG

**ACS-89**
**Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 5452**

No Sample Data Qualified in this SDG

1LCE
LOW CONCENTRATION WATER PESTICIDE ORGANICS ANALYSIS
DATA SHEET

EPA SAMPLE NO.

ACS-GW-PWA-24

Lab Name: COMPUCHEM Contract: OLC03-REVS

Lab Code: LIBRTY Case No.: Client No.: SDG No.: 5452

Lab Sample ID: 545201 Date Received: 01/10/2005

Sample Volume: 1100(ML) Date Extracted: 01/10/2005

Concentrated Extract Volume: 2000(UL) Date Analyzed: 01/10/2005

Injection Volume: 1.0(UL) Dilution Factor: 1.0

Sulfur Cleanup: (Y/N) N Extraction: (Sepf/Cont) SEPF

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (UG/L) | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 0.010 | U |
| 319-85-7 | beta-BHC | 0.010 | U |
| 319-86-8 | delta-BHC | 0.010 | U |
| 58-89-9 | gamma-BHC (Lindane) | 0.010 | U |
| 76-44-8 | Heptachlor | 0.010 | U |
| 309-00-2 | Aldrin | 0.010 | U |
| 1024-57-3 | Heptachlor epoxide | 0.010 | U |
| 959-98-8 | Endosulfan I | 0.010 | U |
| 60-57-1 | Dieldrin | 0.020 | U |
| 72-55-9 | 4,4'-DDE | 0.020 | U |
| 72-20-8 | Endrin | 0.020 | U |
| 33213-65-9 | Endosulfan II | 0.020 | U |
| 72-54-8 | 4,4'-DDD | 0.020 | U |
| 1031-07-8 | Endosulfan sulfate | 0.020 | U |
| 50-29-3 | 4,4'-DDT | 0.020 | U |
| 72-43-5 | Methoxychlor | 0.10 | U |
| 53494-70-5 | Endrin ketone | 0.020 | U |
| 7421-93-4 | Endrin aldehyde | 0.020 | U |
| 5103-71-9 | alpha-Chlordane | 0.010 | U |
| 5103-74-2 | gamma-Chlordane | 0.010 | U |



1/31/05

1LCE
LOW CONCENTRATION WATER PESTICIDE ORGANICS ANALYSIS
DATA SHEET

EPA SAMPLE NO.

ACS-GW-DUP01-24

Lab Name: COMPUCHEM Contract: OLC03-REVS

Lab Code: LIBRTY Case No.: Client No.: SDG No.: 5452

Lab Sample ID: 545202 Date Received: 01/10/2005

Sample Volume: 1100(ML) Date Extracted: 01/10/2005

Concentrated Extract Volume: 2000(UL) Date Analyzed: 01/10/2005

Injection Volume: 1.0(UL) Dilution Factor: 1.0

Sulfur Cleanup: (Y/N) N Extraction: (Sepf/Cont) SEPF

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (UG/L) | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 0.010 | U |
| 319-85-7 | beta-BHC | 0.010 | U |
| 319-86-8 | delta-BHC | 0.010 | U |
| 58-89-9 | gamma-BHC (Lindane) | 0.010 | U |
| 76-44-8 | Heptachlor | 0.010 | U |
| 309-00-2 | Aldrin | 0.010 | U |
| 1024-57-3 | Heptachlor epoxide | 0.010 | U |
| 959-98-8 | Endosulfan I | 0.010 | U |
| 60-57-1 | Dieldrin | 0.020 | U |
| 72-55-9 | 4,4'-DDE | 0.020 | U |
| 72-20-8 | Endrin | 0.020 | U |
| 33213-65-9 | Endosulfan II | 0.020 | U |
| 72-54-8 | 4,4'-DDD | 0.020 | U |
| 1031-07-8 | Endosulfan sulfate | 0.020 | U |
| 50-29-3 | 4,4'-DDT | 0.020 | U |
| 72-43-5 | Methoxychlor | 0.10 | U |
| 53494-70-5 | Endrin ketone | 0.020 | U |
| 7421-93-4 | Endrin aldehyde | 0.020 | U |
| 5103-71-9 | alpha-Chlordane | 0.010 | U |
| 5103-74-2 | gamma-Chlordane | 0.010 | U |



1/31/05

LDC #: 13050A3 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/27/05
SDG #: 5452 Level IV Page: 1 of 1
Laboratory: CompuChem OLC03.2 Reviewer: [illegible]
2nd Reviewer: [illegible]

**METHOD:** GC Chlorinated Pesticides (EPA CLP SOW ~~OLM03.1~~)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

| | Validation Area | | Comments |
|---|---|---|---|
| I. | Technical holding times | A | Sampling dates: 1/7/05 |
| II. | GC/ECD Instrument Performance Check | A | |
| III. | Initial calibration | A | %RSD ≤ 20% except alpha + delta BHC ≤ 25% |
| IV. | Continuing calibration | A | %D ≤ 25 |
| V. | Blanks | A | |
| VI. | Surrogate spikes | A | |
| VII. | Matrix spike/Matrix spike duplicates | A | |
| VIII. | Laboratory control samples | A | LCS |
| IX. | Regional quality assurance and quality control | N | |
| Xa. | Florisil cartridge check | A | |
| Xb. | GPC Calibration | N | |
| XI. | Target compound identification | A | |
| XII. | Compound quantitation and reported CRQLs | A | |
| XIII. | Overall assessment of data | A | |
| XIV. | Field duplicates | ND | D = 1+2 |
| XV. | Field blanks | N | |

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: water

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | ACS-GW-PWA-24 D | 11 | PIBLK6K | 21 | | 31 | |
| 2 | ACS-GW-DUP01-24 D | 12 | PBLKHX | 22 | | 32 | |
| 3 | ACS-GW-PWA-24MS | 13 | | 23 | | 33 | |
| 4 | ACS-GW-PWA-24MSD | 14 | | 24 | | 34 | |
| 5 | | 15 | | 25 | | 35 | |
| 6 | | 16 | | 26 | | 36 | |
| 7 | | 17 | | 27 | | 37 | |
| 8 | | 18 | | 28 | | 38 | |
| 9 | | 19 | | 29 | | 39 | |
| 10 | | 20 | | 30 | | 40 | |

LDC #: 12710A3 (3050A3
SDG #: 4517 5452

# VALIDATION FINDINGS CHECKLIST

Page: 1 of 4
Reviewer:
2nd Reviewer:

OLC03.2
CLP SOW ~~OLM03.1~~

**Method:** Pesticides/PCBs (EPA ~~SW-846 Method 8081/8082~~)

| Validation Area | Yes | No | NA | Findings/Comments |
|---|---|---|---|---|
| I. Technical holding times | | | | |
| All technical holding times were met. | ✓ | | | |
| Cooler temperature criteria was met. | ✓ | | | |
| II. GC/ECD Instrument performance check | | | | |
| Was the instrument performance found to be acceptable? | ✓ | | | |
| III. Initial calibration | | | | |
| Did the laboratory perform a 5 point calibration prior to sample analysis? | ✓ | | | |
| Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%? alpha & delta B#C ≤ x% | ✓ | | | |
| Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used? Resolution = 90% in the mid point | ✓ | | | curve fit was not use |
| Did the initial calibration meet the curve fit acceptance criteria? | ✓ | | | |
| Were the RT windows properly established? | ✓ | | | |
| ~~Resolution check mixture~~ ≥ 60% | | | | |
| Were the required standard concentrations analyzed in the initial calibration? | ✓ | | | |
| IV. Continuing calibration | | | | |
| What type of continuing calibration calculation was performed? ___%D or ___%R | ✓ | | | |
| Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis? 90% Resolution Between adjacent peaks (DBE/M) | ✓ | | | |
| Were endrin and 4,4'-DDT breakdowns ≤ ~~15%~~ 20.0 for individual breakdown in the Evaluation mix standards? 30 combined ≤ 30% | ✓ | | | |
| Was a continuing calibration analyzed daily? | ✓ | | | |
| Were all percent differences (%D) ≤ ~~15%~~ 25.0 or percent recoveries 85-115%? | ✓ | | | |
| Were all the retention times within the acceptance windows? | ✓ | | | |
| V. Blanks | | | | |
| Was a method blank associated with every sample in this SDG? | ✓ | | | |
| Was a method blank analyzed for each matrix and concentration? | ✓ | | | |
| Were extract cleanup blanks analyzed with every batch requiring clean-up? | ✓ | | | |
| Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet. | | ✓ | | |
| VI. Surrogate spikes | | | | |
| Were all surrogate %R within the QC limits? | ✓ | | | |
| If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R? | | | ✓ | |
| If any %R was less than 10 percent, was a reanalysis performed to confirm %R? | | | ✓ | |

LDC #: 13502A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

**METHOD:** GC / HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

| # | Standard ID | Calibration Date | Compound | Reported CF ( std) | Recalculated CF ( std) | Reported Average CF (initial) | Recalculated Average CF (initial) | Reported %RSD | Recalculated %RSD |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CLP-PESTICAL | 12/21/04 | endosulfan I | 2590700 | 2590700 | 2624129 | 2624129 | 2.7 | 2.7 |
| | | | methoxychlor | 1096165 | 1096165 | 1115953 | 1115953 | 1.6 | 1.6 |
| | CLPEST | | | | | | | | |
| 2 | CLPESTII | 12/21/04 | ↓ | 816250 | 816250 | 797946 | 797946 | 14.1 | 14.1 |
| | | | | 298705 | 298705 | 293997 | 293997 | 20.2 | 20.2 |
| | | | | | | | | | |
| 3 | | | | | | | | | |
| | | | | | | | | | |
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| 4 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13050A3
SDG #: 0452

# VALIDATION FINDINGS WORKSHEET
## Continuing Calibration Results Verification


Reviewer: MP
2nd Reviewer: [illegible]

**METHOD:** GC_____ HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

| # | Standard ID | Calibration Date | Compound | Average CF(ical)/ CCV Conc. | Reported CF/Conc. CCV | Recalculated CF/Conc. CCV | Reported %D | Recalculated %D |
|---|---|---|---|---|---|---|---|---|
| 1 | INPAM | 1/10/05 | endosulfan I | 0.020 | 0.019 | 0.019 | 5.0 | 5.0 |
| | CLPEST | | methoxychlor | 0.20 | 0.189 | 0.189 | 5.5 | 5.5 |
| | | | | | | | | |
| 2 | CLPEST II | 1/10/05 | endosulfan I | ↓ | 0.018 | 0.018 | 10.0 | 10.0 |
| | | | methoxychlor | ↓ | 0.178 | 0.178 | 11.0 | 11.0 |
| | | | | | | | | |
| 3 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 4 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13050A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Surrogate Results Verification
CLP SOW OLC03.2

Page: 1 of 1
Reviewer: P
2nd reviewer:

**METHOD:** GC Pesticides/PCBs (EPA ~~SW 846 Method 8081/8082~~)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

**Sample ID:** #1

| Surrogate | Column | Surrogate Spiked | Surrogate Found | Percent Recovery | Percent Recovery | Percent Difference |
|---|---|---|---|---|---|---|
| | CLPEST | | | Reported | Recalculated | |
| Tetrachloro-m-xylene | | | | | | |
| Tetrachloro-m-xylene | | 0.02 | 0.017810 | 89 | 89 | 0 |
| Decachlorobiphenyl | | 0.02 | 0.013746 | 69 | 69 | 0 |
| Decachlorobiphenyl | | | | | | |

**Sample ID:** #1

| Surrogate | Column | Surrogate Spiked | Surrogate Found | Percent Recovery | Percent Recovery | Percent Difference |
|---|---|---|---|---|---|---|
| | CLPEST II | | | Reported | Recalculated | |
| Tetrachloro-m-xylene | | | | | | |
| Tetrachloro-m-xylene | | 0.02 | 0.013173 | 66 | 66 | 0 |
| Decachlorobiphenyl | | ↓ | 0.014586 | 73 | 73 | 0 |
| Decachlorobiphenyl | | | | | | |

**Sample ID:**

| Surrogate | Column | Surrogate Spiked | Surrogate Found | Percent Recovery | Percent Recovery | Percent Difference |
|---|---|---|---|---|---|---|
| | | | | Reported | Recalculated | |
| Tetrachloro-m-xylene | | | | | | |
| Tetrachloro-m-xylene | | | | | | |
| Decachlorobiphenyl | | | | | | |
| Decachlorobiphenyl | | | | | | |

**Sample ID:**

| Surrogate | Column | Surrogate Spiked | Surrogate Found | Percent Recovery | Percent Recovery | Percent Difference |
|---|---|---|---|---|---|---|
| | | | | Reported | Recalculated | |
| Tetrachloro-m-xylene | | | | | | |
| Tetrachloro-m-xylene | | | | | | |
| Decachlorobiphenyl | | | | | | |
| Decachlorobiphenyl | | | | | | |

Notes:

LDC #: 13050A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Florisil Cartridge Check Calculation Verification


Reviewer: [illegible]
2nd Reviewer: [illegible]

**METHOD:** GC Pesticides/PCBs (EPA CLP SOW ~~OLM04.2~~ OLC03.2)

The florisil cartridge check percent recovery (%R) values were recalculated for alpha BHC + endrin using the following calculation:

Percent recovery (%R) = 100 * SR/SA

Where: SR = Spike recovered (ng)
SA = Spike added (ng)

| Lot Number | Analysis Date | Columns | Compound | SR (ng) | SA (ng) | Recalculated %R | Reported %R |
|---|---|---|---|---|---|---|---|
| FL06340 | 7/16/04 | CLPEST | alpha BHC | 0.01 | 0.010 | 100 | 100 |
| | | | | | | | |
| ↓ | ↓ | CLPEST II | endrin | 0.023 | 0.020 | 115 | 115 |
| | | | | | | | |
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| | | | | | | | |

Comments: Refer to Pesticide Clean-up Check (Florisil Cartridge Check) findings worksheet for list of qualifications and associated samples when recalculated results do not agree within 10.0% of the reported results.

LDC #: 13050A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Matrix Spike/Matrix Spike Duplicates Results Verification


Reviewer: [illegible]
2nd Reviewer: [illegible]

CLP SOW OLC03.2

**METHOD:** GC Pesticides/~~PCBs~~ (EPA ~~SW-846 Method 8081/8082~~)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 3 + 4

| Compound | Spike Added (ng/L) | | Sample Concentration (ng/L) | Spiked Sample Concentration (ng/L) | | Matrix Spike Percent Recovery | | Matrix Spike Duplicate Percent Recovery | | MS/MSD RPD | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MS | MSD | - | MS | MSD | Reported | Recalc. | Reported | Recalc. | Reported | Recalculated |
| gamma-BHC | 0.091 | 0.091 | U | 0.067 | 0.067 | 74 | 74 | 74 | 74 | 0 | 0 |
| Heptachlor | ↓ | ↓ | | 0.068 | 0.067 | 75 | 75 | 74 | 74 | 1 | 1 |
| Aldrin | ↓ | ↓ | | 0.071 | 0.074 | 78 | 78 | 81 | 81 | 4 | 4 |
| Dieldrin | 0.18 | 0.18 | | 0.15 | 0.15 | 83 | 83 | 83 | 83 | 0 | 0 |
| Endrin | ↓ | ↓ | | 0.16 | 0.15 | 89 | 89 | 83 | 83 | 7 | 7 |
| 4,4'-DDT | ↓ | ↓ | ↓ | 0.14 | 0.14 | 78 | 78 | 78 | 78 | 0 | 0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13050A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

CLP SOW OLC03.2

**METHOD:** GC Pesticides/PCBs (EPA ~~SW 846 Method 8081/8082~~)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: PLCSHX

| Compound | Spike Added (ug/L) | | Sample Concentration (ug/L) | Spiked Sample Concentration (ug/L) | | LCS Percent Recovery | | LCSD Percent Recovery | | LCS/LCSD RPD | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | - | LCS | LCSD | Reported | Recalc. | Reported | Recalc. | Reported | Recalculated |
| Gamma-BHC | 0.10 | NA | 0 | 0.090 | NA | 90 | 90 | | | | |
| Heptachlor Epoxide | 0.10 | | | 0.091 | | 91 | 91 | | | | |
| ~~Aldrin~~ Dieldrin | 0.20 | | | 0.18 | | 90 | 90 | | | | |
| Dieldrin 4,4'-DDE | ↓ | | | 0.20 | | 100 | 100 | | | | |
| Endrin Endrin | ↓ | | | 0.20 | | ↓ | ↓ | NA | | | |
| ~~4,4'~~-DDT | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13050A3
SDG #: 5452

# VALIDATION FINDINGS WORKSHEET
## Sample Calculation Verification

Page: 1 of 1
Reviewer: EJ
2nd reviewer: [illegible]

CLP SOW OLC03.2

**METHOD:** GC Pesticides/~~PCBs~~ (EPA ~~SW-846 Method 8081/8082~~)

| | | | |
|---|---|---|---|
| Y | N | N/A | Were all reported results recalculated and verified for all level IV samples? |
| Y | N | N/A | Were all recalculated results for detected target compounds agree within 10.0% of the reported results? |

Example:

Sample I.D. _____ _____:

Conc. = ( _____ )
( )

= all ND

| # | Sample ID | Compound | Reported Concentration ( ) | Calculated Concentration ( ) | Qualification |
|---|---|---|---|---|---|
| | | | | | |
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Note: _____

# PRECISION, ACCURACY, REPRESENTATIVENESS, COMPARABILITY, COMPLETENESS SUMMARY REPORT

## American Chemical Service

**02/07/05**

Table of Contents

Glossary

| | |
|---|---|
| CRDL | Contract Required Detection Limit |
| CRQL | Contract Required Quantitation Limit |
| DQO | Data Quality Objectives |
| LCS/LCSD | Laboratory Control Sample / Laboratory Control Sample Duplicate |
| MS/MSD | Matrix Spike / Matrix Spike Duplicate |
| PARCC | Precision,Accuracy,Representativeness,Comparability, Completeness |
| PCBs | Polychlorinated Biphenyls |
| QAPP | Quality Assurance Project Plan |
| QA/QC | Quality Assurance / Quality Control |
| RPD | Relative Percent Difference |
| RL | Reporting Limit |
| SDG | Sample Delivery Group |
| ug/Kg | Micrograms per Kilogram |
| ug/L | Micrograms per Liter |
| USEPA | United States Environmental Protection Agency |
| %D | Percent Difference |
| %R | Percent Recovery |
| %RSD | Percent Relative Standard Deviation |

# PRECISION, ACCURACY, REPRESENTATIVENESS, COMPARABILITY, COMPLETENESS SUMMARY REPORT
## American Chemical Service

## 1.0 INTRODUCTION

Remedial design/ remedial action was conducted at the American Chemical Service, Inc. NPL Site in Griffith, Indiana. This part of the site investigation included the collection and analyses of 2 groundwater residential wells and quality control (QC) samples. The analyses were performed by the following method:

Chlorinated Pesticides and PCBs by EPA CLP SOW OLM03.2

Analytical services were provided by Compuchem who performed analyses on the groundwater samples. The samples were grouped into sample delivery groups (SDGs) of up to 20 field samples received by the laboratory. The environmental samples are associated with QA/QC samples designed to document the data quality of the entire SDG or a sub-group of samples within an SDG. Table I in Appendix A is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample number, and matrix.

Analytical data were validated according to EPA Level 4 data validation procedures. The analytical data were evaluated for quality assurance and quality control (QA/QC) based on the following documents: *The Remedial Design/ Remedial Action PRP-Lead Project at the American Chemical Service, Inc. NPL Site, Griffith, Indiana Quality Assurance Project Plan,* November 2001, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, October 1999, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, February 1994, and the *EPA SW 846 Third Edition, Test Methods for Evaluating Solid Waste.*

This report summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, and comparability (PARCC) relative to the project data quality objectives (DQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

The PARCC summary report evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Each analytical fraction has a separate section for each of the PARCC criteria. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 8 presents a summary of the PARCC criteria by comparing quantitative parameters with acceptability criteria defined in the project DQO's. Qualitative PARCC criteria are also summarized in this section.

**Precision and Accuracy of Environmental Data**

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sampling procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which affect the overall quality of a measurement. Errors in sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC

requirements. The sample matrix also is an important factor in the ability to obtain precise and accurate results within a given media.

Environmental and laboratory QA/QC samples assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include: trip blanks, equipment rinsate blanks, field duplicates, method blanks, laboratory control samples (LCSs), surrogate spikes, matrix spike/matrix spike duplicates (MS/MSDs), and laboratory duplicates.

Before conducting the PARCC evaluation, the analytical data were validated according to the *Remedial Design/ Remedial Action PRP-Lead Project at the American Chemical Service, Inc. NPL Site, Griffith, Indiana Quality Assurance Project Plan,* November 2001, and the Functional Guidelines for Organic Data Review (USEPA 1999) and Inorganic Data Review (USEPA, 1994) and EPA SW 846 Third Edition, Test Methods for Evaluating Solid Waste. Samples not meeting the project procedures manual and the Functional Guideline acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation.

J Estimated The associated numerical value is an estimated quantity. The analyte was detected but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits, but the exceedance was not sufficient to cause rejection of the data.

R Rejected The data is unusable (the compound or analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.

UB Analyte was not detected at or above the indicated concentration due to blank contamination. The "UB" flag is used to qualify any result detected in an environmental sample at a concentration less than 10 times the value of the concentration in any associated blank for common laboratory contaminants and less than 5 times the concentration in any associated blank for all other contaminants

B Analyte was positively detected in a sample and in an associated blank. The "B" flag is used to to qualify any result detected in an environmental sample at a concentration greater than 10 times the value of the concentration in any associated blank for common laboratory contaminants and greater than 5 times the concentration in any associated blank for all other contaminants

UJ Estimated/Nondetected Analyses were performed for the compound or analyte, but it was not detected and the sample quantitation or detection limit is an estimated quantity due to poor accuracy or precision. This qualification is also used to flag possible false negative results in the case where low bias in the analytical system is indicated by low calibration response, surrogate, internal standard, or other spike recovery.

Once the data are reviewed and qualified according to the *Remedial Design/ Remedial Action PRP-Lead Project at the American Chemical Service, Inc. NPL Site, Griffith, Indiana Quality Assurance Project Plan,* November 2001 and the functional guidelines, the data set is then evaluated using PARCC criteria. PARCC criteria provide an evaluation of overall data usability. The following is a discussion of PARCC criteria as related to the project DQOs.

**Precision** is a measure of the agreement or reproducibility of analytical results under a given set of conditions. It is a quantity that cannot be measured directly but is calculated from percent recovery data. Precision is expressed as the relative percent difference (RPD):

$$RPD = (D1-D2)/\{1/2(D1+D2)\} \times 100$$

Where D1 and D2 are the reported concentrations for sample and duplicate analyses. Precision is primarily assessed by calculating an RPD from the percent recoveries of the spiked compounds for each sample in the MS/MSD pair. In the absence of an MS/MSD pair, a laboratory duplicate or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. An additional measure of sampling precision was obtained by collecting and analyzing field duplicate samples, which were compared using the RPD result as the evaluation criteria.

MS and MSD samples are field samples spiked by the laboratory with target analytes prior to preparation and analysis. These samples measure the overall efficiency of the analytical method in recovering target analytes from an environmental matrix. A LCS is similar to an MS/MSD sample in that the LCS is spiked with the same target analytes prior to preparation and analysis. However, the LCS is prepared using a controlled interference-free matrix instead of a field sample aliquot. Laboratory reagent water is used to prepare aqueous LCS. Non-aqueous LCSs are prepared using solid media approved by the American Society for Testing and Materials (ASTM) for their homogeneity. The LCS measures laboratory efficiency in recovering target analytes from either a solid or aqueous matrix in the absence of matrix interferences.

Laboratory and field sampling precision are further evaluated by calculating RPDs for aqueous field sample duplicate pairs. The sampler collects two field samples at the same location and under identically controlled conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the numerical QC limit in either MS/MSD samples or LCS/LCSD indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. Thus, the actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample matrix interference, improper sample collection or handling, inconsistent sample preparation, and poor instrument stability. In some duplicate pairs, results maybe reported in either the primary or duplicate samples at levels below the reporting limit or non-detected. Since these values are considered to be estimates, RPD exceedances from these duplicate pairs do not suggest a significant impact on the data quality.

**Accuracy** is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is used to identify bias in a given measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of MS, MSD, LCS, and samples containing surrogate spikes. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Surrogate spikes are either isotopically labeled compounds or compounds that are not typically detected in the samples. Surrogate spikes are added to every blank, environmental sample, MS/MSD, and standard, for chlorinated pesticides and polychlorinated biphenyl (PCBs) analyses.

Percent recovery (%R) is calculated using the following equation:

$$\%R = (A-B)/C \times 100$$

where:
A = measured concentration in the spiked sample
B = measured concentration of the spike compound in the unspiked sample
C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples, LCS, and surrogate compounds added to environmental samples is evaluated with the acceptance criteria specified by the previously noted documents. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or quantitation limits reported for environmental samples.

**Representativeness** is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population. It is evaluated by reviewing the QC results of blank samples and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, equipment rinsate blanks, and trip blanks.

A method blank is a laboratory grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

Trip blanks are used to identify possible volatile organic contamination introduced into the sample during transport. A trip blank is a sample bottle filled in the laboratory with reagent-grade water and preserved to a pH less than 2 with hydrochloric acid. It is transported to the site, stored with the sample containers, and returned unopened to the laboratory for analysis. Additionally, for inorganic analyses, initial and continuing calibration blanks consist of acidified laboratory grade water, which are injected at the beginning and at a regular frequency during each 12 - hour sample analysis run. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

Contaminants found in both the environmental sample and a blank sample are assumed to be laboratory artifacts if the concentration in the environmental sample is less than 10 times the blank value for common laboratory contaminants; methylene chloride, acetone, 2-butanone, and phthalate esters or 5 times the blank value for other laboratory contaminants.

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times will be specific for each method and matrix analyzed. Holding time exceedances can cause loss of sample constituents due to biodegradation, precipitation, volatization, and chemical degradation.

**Comparability** is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used

in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability is also dependent upon other PARCC criteria, because only when precision, accuracy, and representativeness are known can data sets be compared with confidence.

**Completeness** is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of usable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the project DQOs, the goal for completeness for target analytes in each analytical fraction is 95 percent.

Percent completeness is calculated using the following equation:

$$\%C = (T - R)/T \times 100$$

where:
%C = percent completeness
T = total number of sample results
R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the FSP or QAPP, with the number determined above.

The following sections present a review of QC data for each analytical method.

## 2.0 Chlorinated Pesticides / PCBs

A total of two water samples were analyzed for chlorinated pesticides / PCBs by EPA CLP SOW OLM03.2. All chlorinated pesticides / PCB data were assessed to be valid since none of the 40 total results were rejected based on QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCC criteria and evaluated based on the DQOs.

### 2.1 Precision and Accuracy

#### 2.1.1 Instrument Calibration

Initial and continuing calibration results provide a means of evaluating accuracy within a particular SDG. Percent relative standard deviation (%RSD) and percent difference (%D) are the two major parameters used to measure the effectiveness of instrument calibration. %RSD is an expression of the linearity of instrument response. %D is a comparison of a continuing calibration instrumental response with its initial response. %RSD and %D exceedances suggest more routine instrumental anomalies, which typically impact all sample results for the affected compounds.

The relative standard deviations in the initial calibrations and/or percent differences between the initial calibration and the continuing calibration concentrations were within the acceptance criteria of 20 and 15 percent respectively.

### 2.1.2 Surrogates

No data were qualified based on surrogate recovery nonconformances. In cases where individual recoveries exceeded criteria, the QC exceedance was judged to have no impact on the data quality and no qualifications were made.

### 2.1.3 MS/MSD Samples

No data were qualified based on MS/MSD nonconformances. For those SDGs with MS/MSD results, the recoveries were evaluated against the acceptance criteria.

### 2.1.4 LCS Samples

No data were qualified based on LCS nonconformances. For those SDGs with LCS results, the recoveries were evaluated against the acceptance criteria.

### 2.1.6 Field Duplicate Samples

The field duplicate samples were evaluated for acceptable precision with RPDs for the compounds. The associated data validation narratives provided details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

### 2.1.8 Compound Quantitation and Target Identification

All target compounds identifications were found to be acceptable

## 2.2 Representativeness

### 2.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

### 2.2.2 Blanks

Method blanks were collected and analyzed to evaluate representativeness. The concentration for an individual target compounds in any of the three types of QA/QC blanks were used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results for organic compounds based on the following criteria. The validation qualifier codes used in the blank summary tables are described below.

Results Below the RL If a sample result for the blank contaminant was less than the RL and less than 10 times the blank value for common contaminants or 5 times the blank value for other contaminants, the sample result was amended as a non-detected at the RL for the target compound and qualified with UB

Results Above the RL If a sample result for the blank contaminant was greater than the sample RL and less than 10 times the blank value for common contaminants or 5 times the blank value for other contaminants, the sample result for the blank contaminant was

amended as a non-detect at the concentration reported in the sample results and qualified with UB.

If a sample result for the blank contaminant was greater than 10 times the blank value for common contaminants or 5 times the blank value for other contaminants, the result was not amended and qualified with B.

#### 2.2.2.1 Method Blanks

No QC issues were associated with the method blanks for this analysis.

### 2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the method detection limits attained were at or below the reporting limit. Target compounds detected below the reporting limits flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

### 2.4 Completeness

The completeness level attained for chlorinated pesticides / PCBs field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

## 3.0 VARIANCES IN ANALYTICAL PERFORMANCE

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted according to the laboratory SOW.

## 4.0 SUMMARY OF PARCC CRITERIA

The validation reports present the PARCC results for all SDGs. Each PARCC criterion is discussed in detail in the following sections.

### 4.1 Precision and Accuracy

Precision and accuracy were evaluated usi`ng data quality indicators such as MS/MSD, LCS, and surrogates. The precision and accuracy of the data set were considered acceptable after integration of qualification of estimated results as specifically noted in the data validation reports.

### 4.2 Representativeness

All samples for each method and matrix were evaluated for holding time compliance. All samples were associated with a method blank in each individual SDG. The representativeness of the project data is considered acceptable after qualification for blank contamination.

### 4.3 Comparability

Sampling frequency requirements were met in obtaining duplicates and necessary field blanks. The laboratory used standard analytical methods for their analyses. The analytical results were

reported in correct standard units. Holding times, sample preservation, and sample integrity were within QC criteria. The overall comparability is considered acceptable.

### 4.4 Completeness

Of the 40 total analytes reported, none of the sample results were rejected. The completeness for all SDGs is as follows:

| Parameter/Method | Total Analytes | No. of Rejects | %Completeness |
|---|---|---|---|
| Chlorinated Pesticides & PCBs | 40 | 0 | 100 |
| **Total** | **40** | **0** | **100** |

The completeness percentage based on rejected data met the 95 percent DQO goal. A less quantifiable loss of data occurred in the application of blank qualifications.